

NISTTech

Micellar Gradient Focusing

Microfluidic analysis system combining multiple process steps into one simple operation for robust, reliable, and high quality results in the field

Description

The invention provides a method for the preconcentration and or separation of analytes in solution. In particular, it provides a focusing method for analytes that cannot be separated or focused based purely upon their electrophoretic mobilities (neutral species, or chiral species, for example). The separation can be used as a part of a chemical or biochemical analysis in a microfluidic chip or capillary system.

This method combines the characteristics and utility of Micellar Electrokinetic Chromatography with those of focusing wherein the pseudostationary phase provides a medium for analytes to move at differing velocities along the separation channel, and hence facilitate a focusing separation modality.

Applications

- **Drug Discovery**
- **Bodily fluids testing**
- **Food and beverage analysis**
- **Environmental monitoring**

Advantages

- **A method based on properties of the analyte molecules other than the electrophoretic mobility of the molecule.**
- **Portable**
Simple microfluidics for "point-of-use" analysis
- **Reliable**
Streamlined analysis process leaves a smaller chance of incorrect results
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Abstract

A method and device are provided for affinity gradient focusing for directing at least one analyte in a solution containing a pseudostationary phase and located in a channel such as a capillary or a microchannel. The method includes establishing a steady-state spatial gradient in a retention factor of the pseudostationary phase for the at least one analyte. The analyte is caused to be moved within the channel whereby the concentration of the at least one analyte changes at one or more positions along the gradient. The pseudostationary phase is charged and the analyte is either neutral or charged or alternatively, the pseudostationary phase is neutral and the analyte is charged. The device may include a fluid channel, a pseudostationary phase having a retention factor gradient, an electrical current source and a pump system for establishing the bulk flow in the solution in the channel.

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References

- U.S. Patent # 7,718,046 issued 10/21/2004, expires 8/11/2028
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Status of Availability

This invention is available for licensing exclusively or non-exclusively in any field of use.

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